DIESEL EMISSIONS

The Problem: DIESEL EMISSIONS

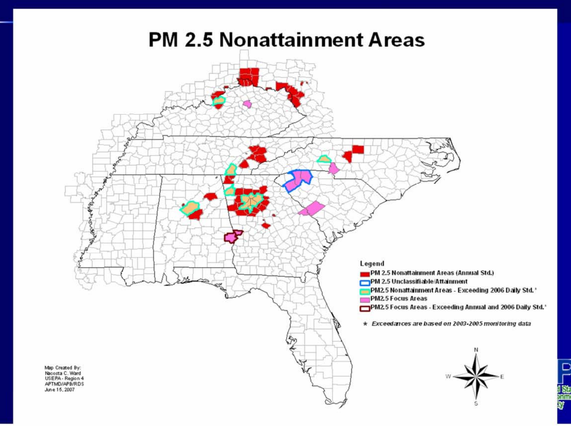
Diesel emissions contribute to:

- Ozone (NOx)
- Particulate Matter/Haze
- Air Toxics

Diesel exhaust poses significant public health concerns:

- Exacerbates asthma, causes respiratory and cardiovascular illness, a potential cause of cancer and premature death
- Are likely human carcinogen at occupational and environmental exposure levels

DIESEL EMISSIONS are the primary mobile source contributor to fine particulate matter ($PM_{2.5}$);



The Solution

Significant diesel emissions reductions can be made only through cooperative partnerships between private and public agencies and through implementation of multiple strategies

Strategies include:

- Retrofit (emission reducing mufflers, etc.)
- Rebuild (equipment and ag pumps)
- Replacements (engines)
- Refuel (cleaner diesel, biodiesel, etc.)
- Idle Management

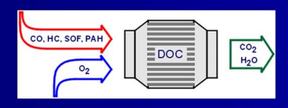
What is Retrofit Technology?

Diesel Retrofit refers to any change to an engine system above and beyond what is required by EPA regulations that improves the engine's emission performance:

- Catalyst or filter (mufflers)
  - Diesel Oxidation Catalysts (DOCs)
  - Diesel Particulate Filters (DPFs)
  - And more
- Engine upgrade
- Early engine replacement
- Use of cleaner fuels or additives
- Idling control equipment
- Combination of above

Diesel Oxidation Catalyst (DOC)

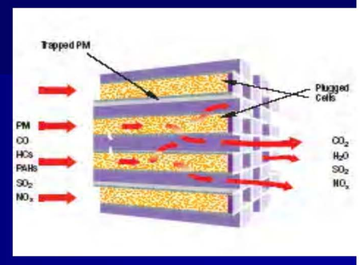
- What is it?
  - Device that oxidize pollutants in the exhaust stream and can be packaged with mufflers
- What does it do?
  - Reduces PM (10-50%), HC 50%, CO 40%
- Issues:
  - Most widely used technology
  - No maintenance required
  - Lower PM reductions than DPF
  - Applicable to most engines and vehicles
  - Verified for dockside and construction equipment

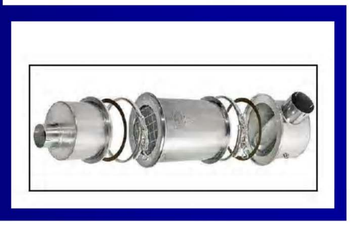


Hydrocarbons + O_2 = CO_2 + H_2O
CO + ½ O_2 = CO_2

Diesel Particulate Filter (DPF)

- What is it?
  - Honeycomb or mesh devices placed within exhaust stream that physically trap and oxidize PM
- What does it do?
  - Reduces PM, HC, CO (+85%)
- Concerns:
  - Must be used with ULSD
  - Passive filters require higher operating temp. (>250 C)
  - Periodic removal of unregenerated ash





Summary

- Reducing emissions from diesel engines is one of the most important air quality challenges facing the country
- Region-wide network and technical resources are available to reduce diesel emissions
- It's a shared responsibility – federal, state, private, local organizations all have to do their part

For More Information

Visit EPA's National Clean Diesel Campaign Website

www.epa.gov/cleandiesel

And the Southeast Diesel Collaborative website

www.southeastdiesel.org